

Research Assistant in Novel Materials for Sensing

Job Ref: REQ260716

School/Department summary:

The Wolfson School of Mechanical, Electrical and Manufacturing is one of the leading Engineering Schools in the country. With a strong tradition in Manufacturing and in the discovery and application of Materials for applications in a broad range of industrial sectors (e.g., electronics, bioengineering & healthcare, automotive, food industry, etc), we strive for academic excellence and research at the leading edge.

Project Description:

The project entails the investigation on the use of low-dimensional materials to develop new sensing devices. The overarching objective is to generate new electronics, photonics, and bioelectronic sensing concepts, including detectors that operate in the region of the electro-magnetic (EM) spectrum spanning from the X-ray to visible wavebands. The aim is to exploit novel materials to develop sensors with new and/or enhanced functionality and hence greater capability compared to existing systems for situational awareness and intelligence, surveillance and reconnaissance applications.

The role will involve assisting in the development of a proof-of-concept device prototype, selecting and optimising material structures, optimising ink formulations and fabrication process, for device integration on passive and active electronic substrates.

Job Description

Job Family and Grade: Specialist and Supporting Academic Grade 5

Job Purpose

To contribute to research in the area of advanced materials for sensors. The role involves supporting the design and development of novel proof-of-concept sensing devices and engineering prototypes for lab testing and demonstration, including test beds design and development, data collection, analysis, lab work, firmware programming, computational modelling and simulation, technology validation.

Job Duties

- To assist in the design and development of new sensing concepts for devices and systems for data-driven continuous monitoring, and real-time event-based detection.
- To apply knowledge in parametric modelling and CAD tools, to assist device design and optimisation.
- To undertake systematic characterisation of materials and devices developed, including conducting failure mode and engineering analysis.
- To collate, manage, and evaluate data derived from experimental testing ensuring accurate data analysis and signal processing.
- To establish and refine additive manufacturing and advanced manufacturing techniques for test beds and demonstration prototypes, including through additive manufacturing and electronic read-out circuit integration.
- To feed back to the project team on progress, to make recommendations for next steps.
- Write up regular progress reports and present outcomes to all Investigators and Collaborators.
- Travel to attend meetings and make presentations both within the project partners working group and to external stakeholders.
- To support the project team by enhancing relationships with existing collaborators

- To write or contribute in research papers suitable for publication in high quality academic journals.
- To attend and contribute to conferences.
- To contribute to project promotion and public engagement events.
- Contribute ideas for new research and enterprise directions.
- Always maintain confidentiality and ensure that intellectual property (IPR) agreements are not violated.
- To assist the academic staff in the project team with the supervision of undergraduate MSc and PhD project work and day-to-day supervision and support of other researchers.
- Where appropriate, to deliver teaching, tutorial and laboratory sessions to students.
- Engage in training programmes in the University (or elsewhere) that are consistent with the needs and aspirations of the project and those of the Department.

Points To Note

The purpose of this job description is to indicate the general level of duties and responsibility of the post. The detailed duties may vary from time to time without changing the general character or level of responsibility outlined in the document.

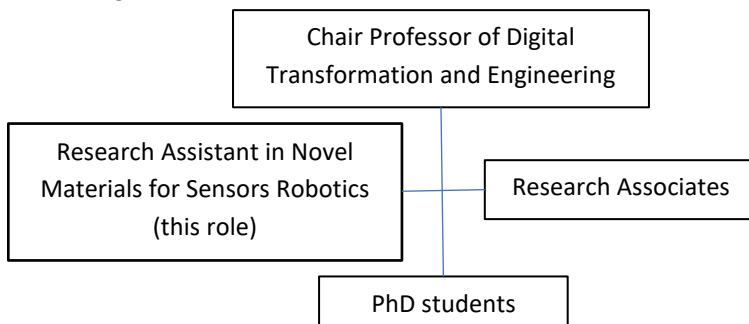
Organisational Responsibility

Reports to the: Chair Professor of Digital Transformation and Engineering

Direct Reports: N/A

Budget Responsibilities: N/A

Structure Chart:



Person Specification

Your application will be assessed based on the essential and desirable criteria listed below.

Applicants are strongly encouraged to explicitly demonstrate how they meet each essential (and desirable) criteria at the application stage. The criteria that you need to demonstrate in your application will be listed as Stage 1 in the table below.

Stages of assessment are as follows:

- 1 – Criteria measured at Application
- 2 – Criteria measured at Test/Assessment Centre/Presentation
- 3 - Criteria measured at Interview

Essential Criteria: When completing the section below, clearly state the essential requirements of the role and think broadly. Focus on what must be accomplished rather than how it should be done. Consider experience outside of higher education where appropriate. Avoid requiring all criteria to be measurable from the application form; for example, skills and abilities may be better assessed through tests/ assessments and/ or interviews. As a rule, aim for no more than 5-7 criteria to be measured at the application stage.

Area	Criteria	Stage
Experience	Background in Engineering, Chemistry or Materials Science, with focus on mechatronic systems and design techniques	1
	Demonstrated experience in mechanical and electronic design, embedded firmware programming, mechatronic systems, robotics, machine learning, data analysis, signal processing, sensing devices and test prototypes	1
Skills and abilities	Some experience in: • Use of prototyping and analytical equipment in a laboratory environment including 3D printing, electronic circuit assembly and repair, laser cutting equipment. • Computational modelling and CAD tools to assist the design and optimisation tasks such as AutoCAD, SolidWorks, LTSpice, or equivalent. • Acquiring, curating and analysing data derived from field trials, including through advanced signal processing and high-level programming such as Python, C/C++, Java, and simulation/analytical frameworks such as MATLAB, Simulink, ROS or equivalent. • Microcontroller-based systems, including STM32, ARM or equivalent. • Sensor-integrated devices and systems in a lab environment.	1,3
	Good written and oral communication skills	1,2
	Self-motivated with ability to meet deadlines	3
	Able to manage time and task effectively to meet project deadline and prioritise workload with minimum supervision	3
	Able to build and maintain effective working relationships with academic colleagues, students, and external partners to support collaborative research and communication of findings.	3
	Ability to write project reports and make technical presentations to industrial and academic research groups	3
	Knowledge of relevant Health & Safety issues	1

Training	Demonstrate evidence of having undertaken further training in laboratory safety, including the preparation of risk assessments and COSHH forms.	2,3
Qualifications	Master's degree on a related subject, or equivalent experience.	1
Other	Uphold and actively contribute to the University's commitment to Equity, Diversity and Inclusion.	1,3

Desirable Criteria: These are skills, experience and competencies that are additional extras that may be used to narrow the pool down if we receive a high volume of applications all meeting the essential criteria.

Area	Criteria	Stage
Experience	Further project-specific experience in securing and contributing to translational research grants or entrepreneurship programs.	1,3
	Developing proposals for funding from external agencies	1,3
	Working in a high-quality academic research environment	1
	Experience of teaching and / or supervision of students in relevant areas	1
Skills and abilities	Authoring original work, in the highest quality refereed academic journals	1
	A publication track record in peer-review journals and/or conference proceedings.	1

Conditions of Service

The appointment will be subject to the [University's Terms and Conditions of Employment](#) relevant to the job grade.

Shared University Responsibilities

As a member of the Loughborough community, you are expected to:

- Take reasonable care of yourself, others and the environment, and to prevent harm by your acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Sustainability Policies & Procedures.
- Support and contribute to the University's commitment to Equity, Diversity, and Inclusion (EDI), while carrying out all duties in a way that respects these principles and upholds the right to free expression. Further information about EDI at Loughborough and our strategic aims is available on our website

Our Purpose, Vision, and Values

Our purpose, Vision and Values underpin all that we do and shape how we work together at Loughborough.

We're proud to promote our values: **Adventurous, Collaborative, Creative, Authentic** and **Responsible**. Our people bring these values to life every day, and they are central to the positive and supportive culture that makes Loughborough unique.

If you join us, you'll be encouraged to bring these values to life in your own work and contribute to the positive, supportive culture that makes Loughborough unique.

Read more about our [vision and values](#).

Our Accreditations [include any additional accreditations relevant to your school/department]



We strive to create a culture that supports equality and celebrates diversity throughout the campus. The University holds a [Bronze Athena SWAN award](#) which recognises the importance of support for women at all stages of their academic career.



We are proud to be a [Race Equality Charter Member](#). The Charter aims to improve the representation, progression and success of all minority ethnic staff and students within higher education and address issues of racism within higher education institutions (HEIs).



We are proud to be a Disability Confident Employer and have adopted a proactive approach to employing disabled people and to creating a more diverse workforce. We ensure that our recruitment processes are inclusive and accessible. We guarantee to offer an interview to all applicants who have declared themselves with a disability, provided they meet the essential criteria for a role. We proactively anticipate and provide reasonable adjustments and support existing employees who acquire a disability or long-term condition to thrive in the workplace.



We are a real living wage employer, and our Living Wage Employer Mark shows our commitment to paying our staff according to the cost of living.



We are proud supporters of the [City of Sanctuary movement](#) and delighted to be recognised as a University of Sanctuary. This national network brings together, university staff, lecturers, academics and students, who together work to make Higher Education institutions place of safety, solidarity and empowerment for people seeking sanctuary.

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.